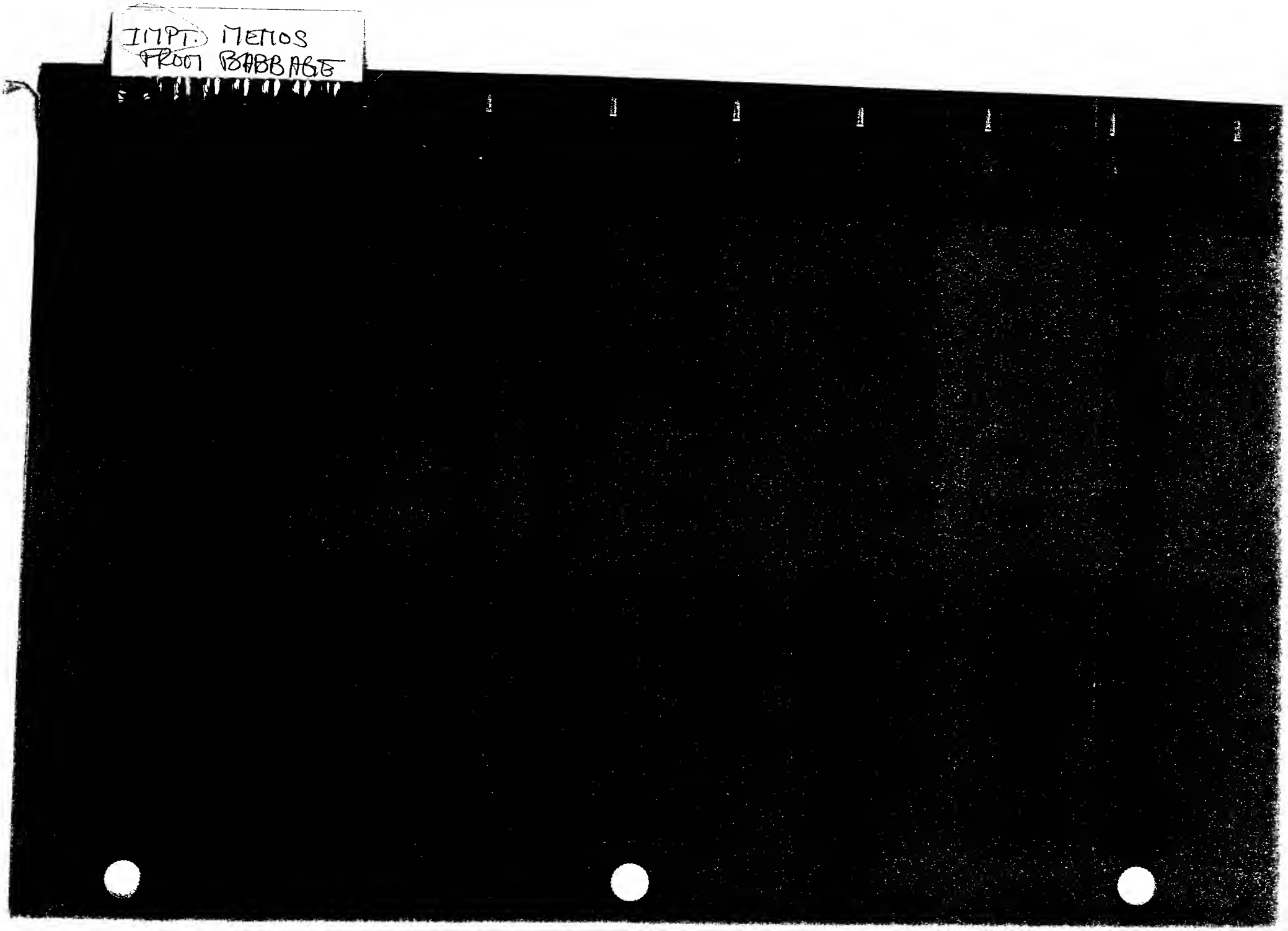

IMPT. MEMOS
FROM BABBAGE

ADVANCED RESEARCH PROJECTS AGENCY
Washington, D. C. 20301

June 21, 1968

MEMORANDUM FOR THE DIRECTOR, PROGRAM MANAGEMENT

SUBJECT: Interactive Computer Network Communication System

The purpose of this memorandum is to request an ARPA order be written to ARO-Durham for $563 K to initiate a contract for the design, construction, installation, test and maintenance of interface message processors (IMPs) to form a communication system to support the ARPA network activities. The contractor is to be selected by competition between selected bidders.

APP No. 723, submitted with this memorandum, describes the requirements for a network and the need for a distributed store and forward communications system. A detailed specification has been written to permit potential contractors to bid on providing the IMPs. This bid will be for total system responsibility. Bidders who are not computer manufacturers must therefore negotiate with a manufacturer on the price and delivery of the hardware which they select. The initial contract will request the design, production, delivery, test, and evaluation of four IMPs. The initial installations will be at Stanford Research Institute; U.C., Santa Barbara; UCLA; and the University of Utah.

The development of this distributed communication system will not only provide the communications capability required for the ARPA computer research facilities, but will also be a unique prototype of future communication systems. Additionally, this network will provide an opportunity to demonstrate a form of communications organization recommended in a distributed digital network study by the RAND Corporation.

Administrative Considerations

The $563 K should provide sufficient funds for the IMP design, the purchase of four IMPs and their installation at the initial nodes. A small network which will be created between these four nodes will be used mainly to evaluate the performance of the store and forward communication system. If the basic design proves satisfactory, the extension of the network to include additional nodes will be considered. Fiscal 1969 funds have been programmed for this purpose.

Transfer Plan

It is anticipated that the communication system being developed will be attractive to the common carriers as a potential data service. After four nodes of the network can be demonstrated, a common carrier will be asked to make an economic evaluation addressing the desirability of offering such communications as a service. When the entire net is established and operating smoothly, the carrier may be requested to manage the net, thus directly providing digital message transmission as a tariffed service. This will be particularly desirable when the computer network is sufficiently developed to include more research centers such as the NSF supported activities.

Reporting Requirements

Quarterly progress reports, and final reports covering entire design and evaluation at the end of the initial contract.

Contractor Selection

To be selected through competitive evaluation by a panel of ARO-Durham and ARPA personnel.

Agent and Level of Support

ARO-Durham personnel have been involved in the preparation of the specification. Technical support will be requested of ARO-Durham; however, the project responsibilities should remain with ARPA.

SIGNED

Lawrence G. Roberts
Special Assistant for
Information Sciences

Enclosure
APP 723

ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON, D. C. 20301

ARPA Order No. 1137
Program Code No. 8D30
Program Element No. 6.15.45.01.D
Industrial Priority Rating: DO

December 6, 1967 Date

TO: Commanding Officer
U. S. Army Research Office (Durham)
Box CM, Duke Station
Durham, North Carolina 27706

1. You are requested to initiate a four-month contract with Stanford Research Institute for a study related to the design and specification of a computer network. The work should be in accordance with the contractor's proposal No. ESU 67-92, "A Study of Computer Network Design Parameters", dated November 7, 1967, with work statement as follows:

a. The contractor will study the effects of selected network tasks upon Interface Message Processors (IMP's) and the communication facilities serving a highly responsive network of computers. Among the tasks to be studied are:

(1) The coding of the information exchanged between the IMP's (e.g., USACSII vs. non-USACSII, transparent binary transmission)

(2) Acknowledgement procedures (e.g., message block formation, restraint of message flow)

(3) Operational procedures (e.g., user access validation and control, recovery from abnormal conditions)

b. The effects of alternative design choices will be characterized in terms of IMP computational capacity, storage capacity, special hardware requirements, and loading of the communication facilities.

c. In carrying out this study, the contractor will communicate with other ARPA contractors who are potential participants in such a network.

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2. The study should commence as soon as possible, not later than January 1, 1968. The total price is estimated to be $19,586; an additional amount of $214 is provided for ARO-D expenses in connection with monitoring this contract.

3. This Order makes available $19,800 under appropriation and account symbol "97X0400.1301 Research, Development, Test and Evaluation, Defense Agencies", for obligation by ARO-D on behalf of the Advanced Research Projects Agency, only for purposes necessary to accomplish the work specified herein. These funds are immediately available for direct obligation. The funds made available herein are not for the construction of facilities.

4. A final technical report should be prepared and submitted in accordance with the instructions set forth in the attachment to our memorandum dated September 13, 1966, subject: "ARPA Orders - General Requirements."

5. It is requested that two copies of each contract or contract modification awarded as a result of this Order be submitted to the Director, ARPA. In transmitting such documents, specific reference should be made to ARPA Order No. 1137.

6. The General Requirements as stated in the attachment to the ARPA memorandum of September 13, 1966, are included in this Order by reference.

E. Rechtin
Director

Copy to:
Secretary of the Army

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